SURGICAL NUMBER

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION

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1941 NATIONAL CONVENTION—ATLANTIC CITY—JUNE 23-27

1941 Directory Now Being Prepared

Help make this the largest directory in the history of the Association, both in national and state memberships, by paying your own dues at once, if they are not already paid—then by contacting the non-members in your vicinity. The deadline date for new applications to be received in time for membership listing is October 20.

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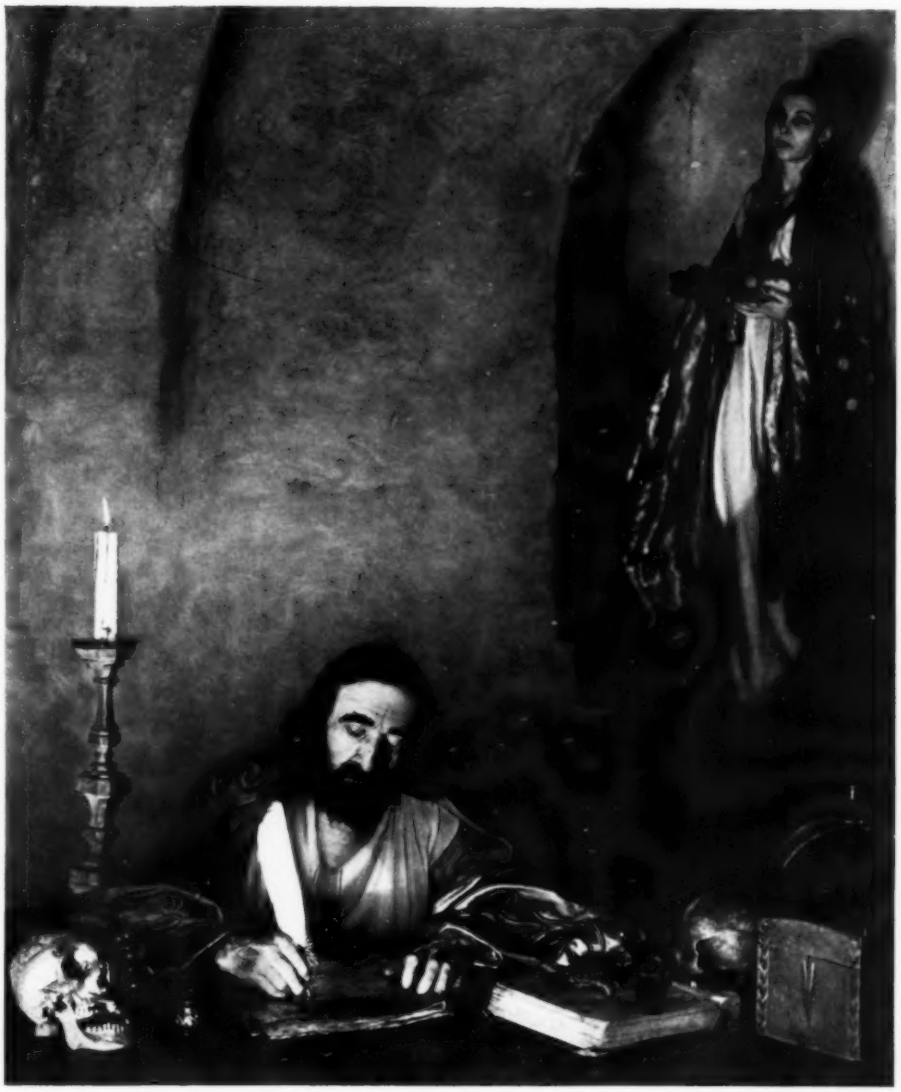

BRUNO OF CALABRIA whose *Chirurgica Magna* (1252) is notable as the first work to cite both Greek and Arabian writers, also compiled a *Chirurgica Minor* in 23 chapters. In the treatment of large wounds he advises careful suturing with silk or linen, one end of the wound to be left open and sutures to remain for eight days. For abdominal wounds he suggests suturing the peritoneum to the abdominal musculature and emphasizes the advantages of dry healing in all cases.

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1505	½-circle needle A-5	28″	4.20

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1545	½-circle needle A-5	28″	4.20

Sizes: 00, 0, 1

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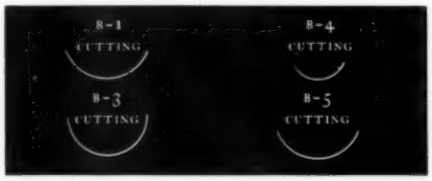

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1652	Kal-dermic, B-5	18″	4-0, 00
1653	Black silkworm gut, B-1	14″	4-0
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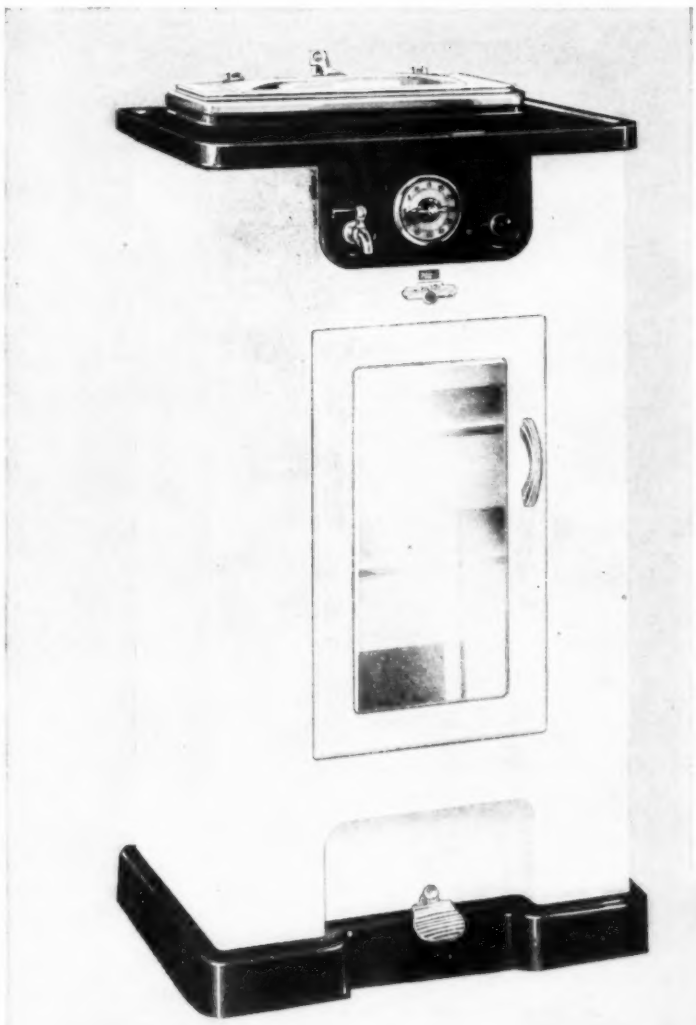

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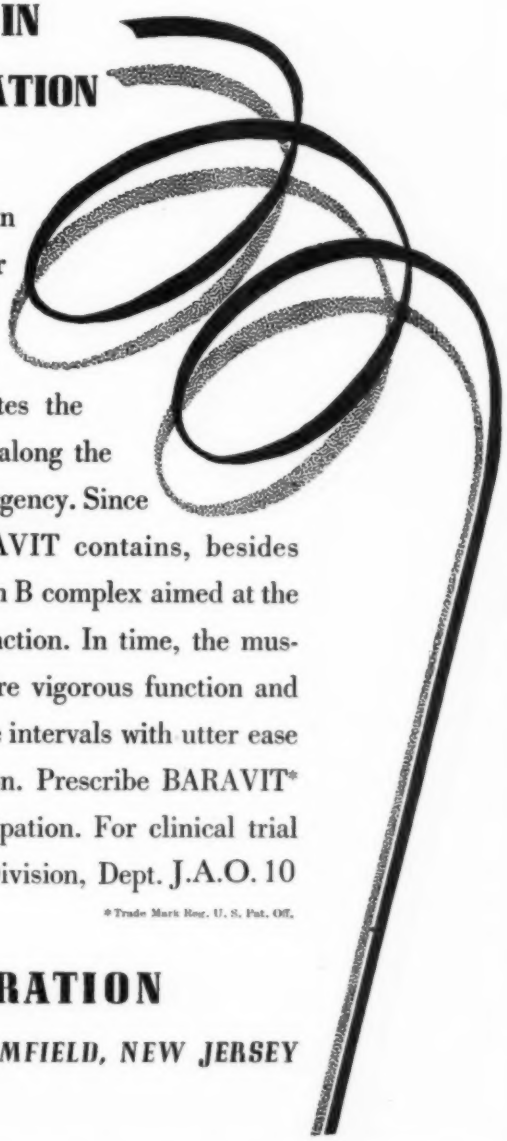

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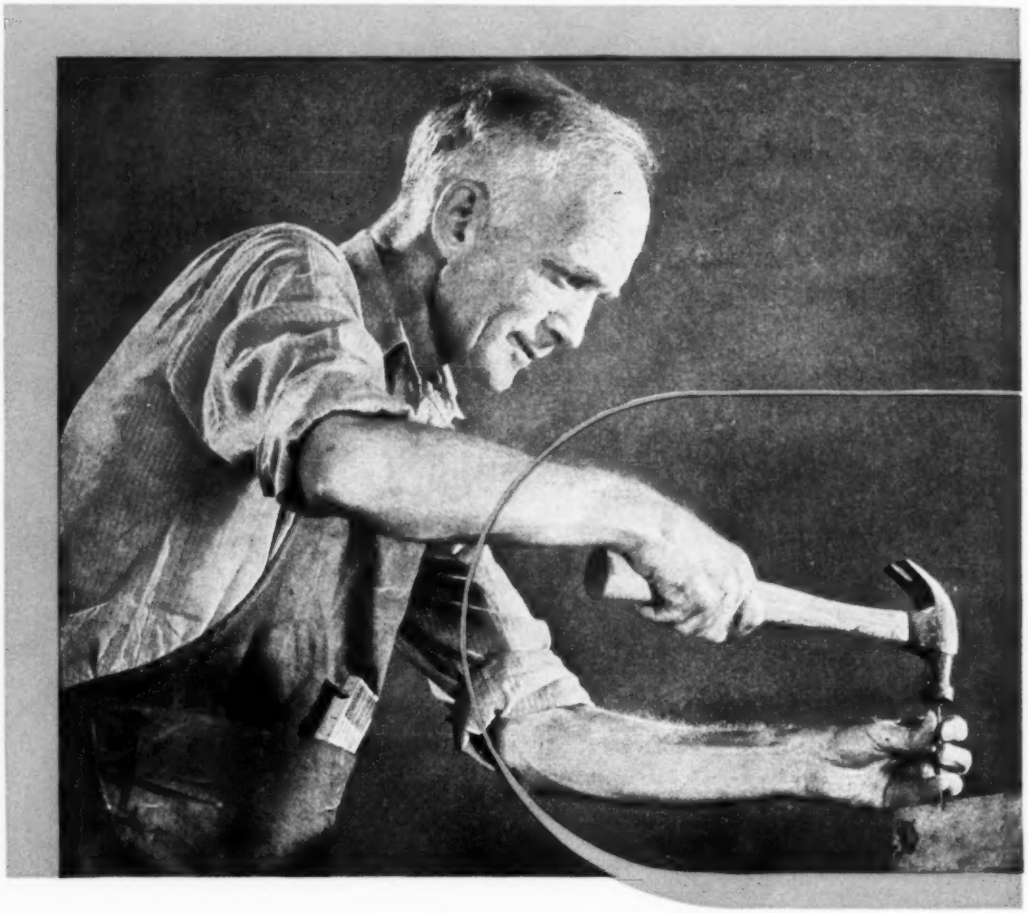

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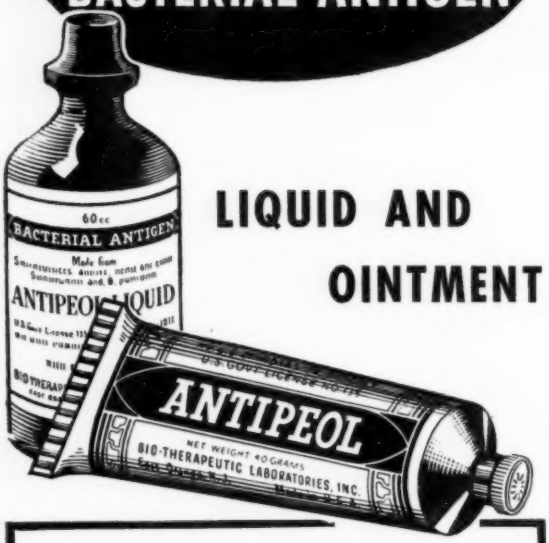

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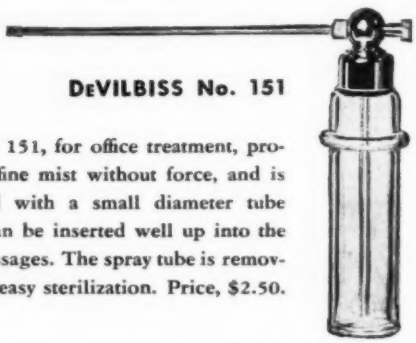

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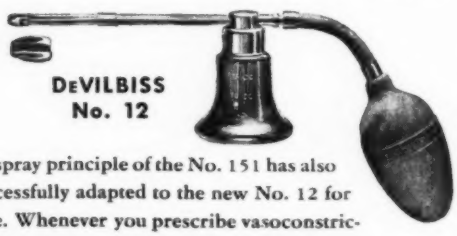

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*"**PEPTIC ULCER** – The Effect of High Protein Diet on the Behavior of the Disease" by Windwer and Matzner, Am. Jl. Dig. Dis. 5:743, 1939.

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THE TRACE ELEMENTS IN BIOLOGICAL MATERIALS

● Students of nutrition recognize a total of some thirteen inorganic elements either as essential to humans or, in our present state of knowledge, as probably desirable for complete nutrition. For certain of these elements—definitely proven to be essential—reasonable estimates of the daily human requirements have been made. In addition, the distribution in common foods of minerals, especially those essential minerals most apt to be deficient in the diet, is well understood. Certainly, enough information appears to be at hand to insure an optimal supply for the individual of these essential or desirable elements through modern diet planning.

However, for many years it has been known that traces of elements, other than those known to be essential, may be present in animal and plant tissues (1, 2). Improvements in analytical techniques have been made and greater precautions observed in the handling of the materials used for analysis in studies reported within recent years. The results of these newer investigations have only served to confirm the fact observed in the older studies, namely, that "trace elements" may be present in biological materials, including mammalian tissues, along with the other elements recognized or accepted as essential in nutrition.

A fairly complete list of the trace elements includes silicon, aluminum, fluorine, nickel, arsenic, bromine, rubidium, barium, and selenium. The persistent occurrence of these elements in foods and in animal tissues logically raises two questions. First, are these elements essential in human nutrition, and second, assuming them to be essential, how might an adequate supply be obtained.

For the first of these two questions, there is as yet no conclusive answer (1, 2). Study of the possible part the trace elements may play in normal body functions comprises one of the frontiers of nutritional research. The fact that the trace elements are more or less consistently present in animal tissues is not necessarily conclusive proof of their essential character in nutrition; further research alone must decide that point.

The second of the above questions can be answered somewhat indirectly. It is not illogical to believe that we already recognize as essential those elements whose serious deficiency in the diet may produce the most serious irregularities in the human organism. Further, as stated above, the distribution of the known essential minerals in foods is well understood and by modern diet planning an adequate supply of these nutrients should be readily attained. It is not meant to imply that all of the trace elements are without significance in human nutrition, or that one essential nutrient is more important than another. Instead, it is intended to suggest that the distribution of all elements in foods is probably such that a protective diet—calculated to supply optimal amounts of all known essential minerals—should also supply the proper amounts of any unknown essential elements, as well.

Thus, the need for following the modern pattern of diet formulation is further indicated. The most practical means of insuring the needed quantities of all essential nutrients—recognized or as yet undiscovered—is to plan the ration according to the concepts and teachings of the modern science of nutrition. In pursuing the modern diet pattern (2), commercially canned foods should prove both valuable and convenient.

AMERICAN CAN COMPANY
230 Park Avenue, New York, N. Y.

REFERENCES

1. 1939. Mineral Metabolism, Alfred T. Shohl, Reinhold, New York.
2. 1939. Food and Life, Yearbook of Agriculture, U. S. Dept. Agri., U. S. Government Printing Office, Washington, D. C.

We want to make this series valuable to you, so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned-foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles. This is the sixty-fourth in a series, which summarizes, for your convenience, the conclusions about canned foods reached by authorities in nutritional research.

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Handbook of Physical Therapy, 3rd ed. American Medical Association, 1939.

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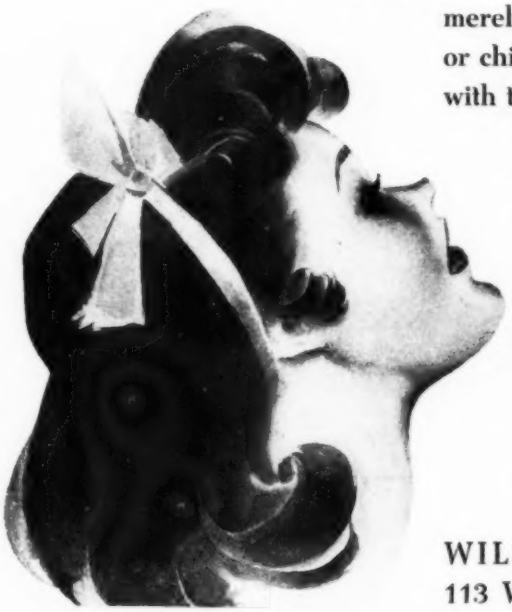

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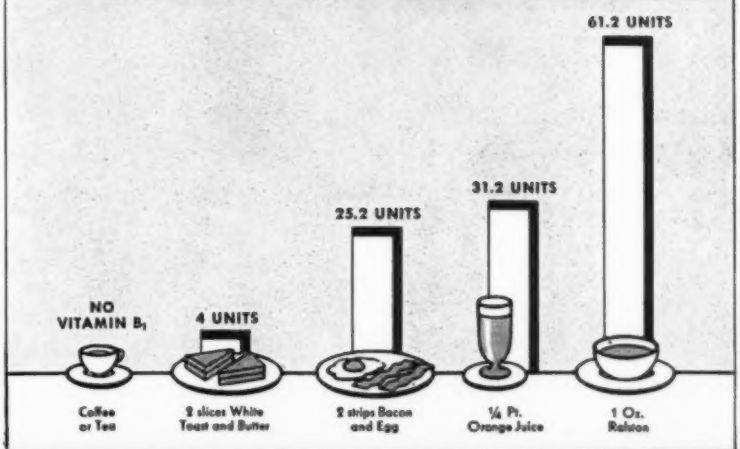

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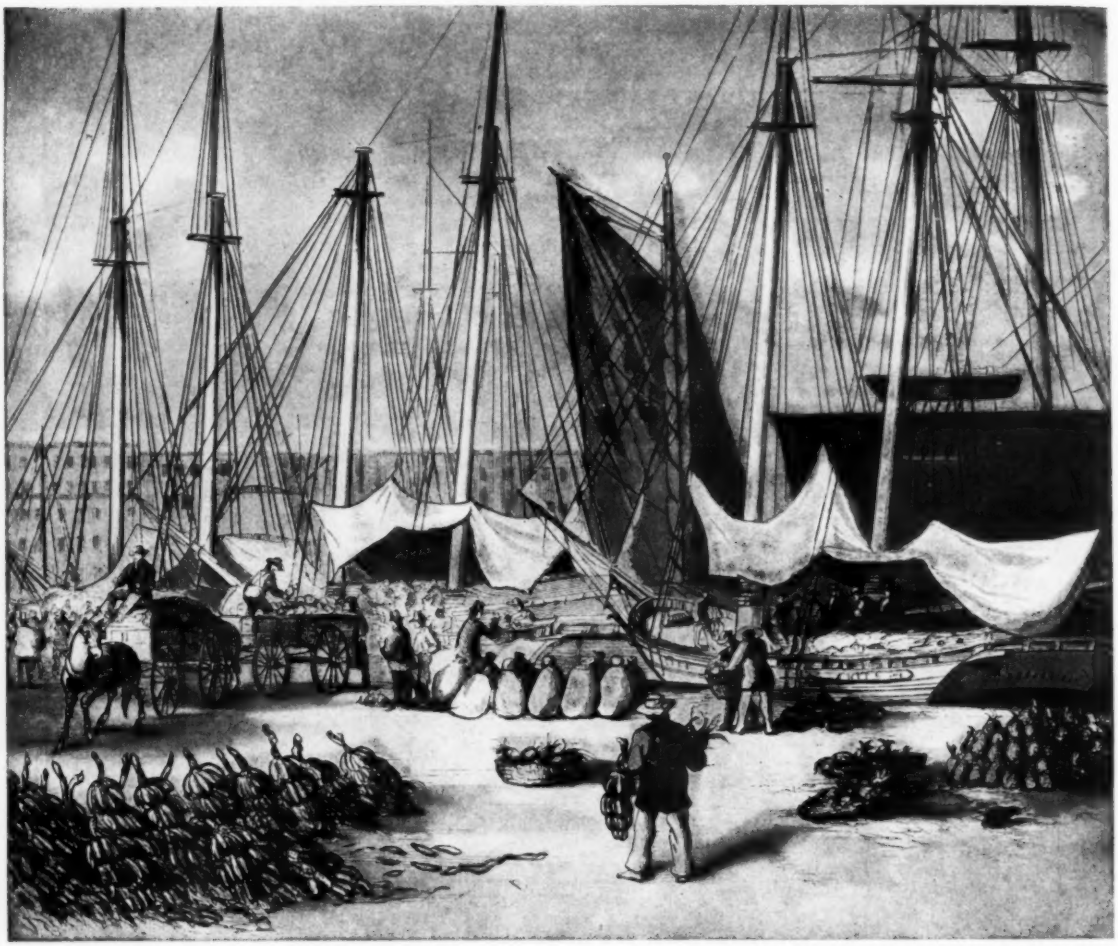

From Frank Leslie's Illustrated Newspaper, July 29, 1865

POST-OPERATIVE FEEDING

A REVIEW of the recent literature reveals a renewed interest on the part of the surgeon in diet therapy. Post-operative feeding, especially in prolonged convalescence, must be aimed to supply adequate calories, vitamins and minerals.

The banana is a bland food; well tolerated by most people, even those with capricious appetites. It has a low residue, but is mildly laxative to some people. It has an alkaline ash. The chief source of its calories is in its carbohydrate content. It also contains vitamins A, B_1, C and G as well as many essential minerals. It is readily miscible with milk and can be served for the between-meal nourishment.

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The Journal of the American Osteopathic Association

PUBLISHED MONTHLY BY THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 40, No. 2 | 540 N. Michigan Ave., Chicago, Ill. | October, 1940

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Applied Anatomy of the Pelvis and Lower Extremities*

W. F. STRACHAN, D.O.

Chicago

A person does not have to progress far in anatomical or clinical observation before being impressed with the interdependence of the spinal column and the lower extremities. The nerve supply, blood supply and drainage of the extremities are affected to a great extent by lesions of the spinal joints. The lower extremities, acting as the supporting base, can produce mechanically symptoms referable to the trunk. The muscles of the lower extremities function both in moving the related parts and in balancing the body above. In the presence of mechanical faults, they are forced to work under difficulty.

A lesion of a joint manifests itself first and most definitely in the related soft structures, including muscles. Analysis of muscle tension and mobility of joints is as necessary in the extremities as in the spine. Diagnosis of any complaint in a peripheral part is not complete without analysis of the region of the spine segmentally related. This is true even when the local factor is a fracture of a bone. The related spinal lesion may have preceded the fracture, may have been produced at the same time, or may follow it as a result of reflex action.

Our main consideration at this time includes the alterations in mobility and tissue tension in the pelvis and lower extremities to compensate for structural imbalance.

Since tissue tensions are important in postural analysis and since posture begins at the feet, we may begin our discussion with consideration of the feet.

Let us take, for example, flat foot. The severity of foot symptoms is not necessarily in proportion to the amount of flattening of the arches. An abnormally high arch may be more painful than a flat foot. A foot of this former or inverted type usually shows increased tension in the lateral or peroneal group of leg muscles, with fibrotic shortening of the plantar fascia and lateral tension at the ankle. Prolonged tension on plantar fascia may result in spur formation at its attachment to the calcaneus.

In the everted or flattened foot, the position of the calcaneus is altered so that the talus transmits increased weight to the medial side of the foot. Tension is increased on the medial side of the ankle, in the leg muscles which invert the ankle, namely tibialis anterior and posterior, and in the long flexors of the toes.

Interference in the mediolateral stability of the ankle produces one-sided tension at the knee, predisposing it to the abduction or adduction type of lesion. For example, in the everted foot, the superior articular surface of the talus is lower on the medial than on the lateral side; the distal surface of the tibia being required to fit the articular surface of the tibia, a medial tilt of the shaft of the tibia is produced. The result, from this factor as well as from the increased tension in the invertors of the ankle, is a tension stress on the medial side of the knee and a compression stress on the lateral side. When the knee can no longer withstand this one-sided strain, it gaps on the medial side and is hypermobile in abduction. Knee symptoms in this case will respond when the foot and ankle are properly aligned. A temporary wedge on the medial side of the shoe may be necessary as part of the program of treatment.

In this valgus type of knee a tendency to repeated lateral positions of the patella may occur. Quadriceps femoris muscle pull is exerted in a straight line down to the tuberosity of the tibia and with the knee in the valgus position, a considerable lateral component of force is exerted on the patella. Specific manipulation of the knee with weight-bearing exercises to strengthen the extensors of the knee and patellar retinacula is usually sufficient to prevent recurrences.

The fibula, although it does not bear weight, is closely related to the knee, ankle, and talocalcaneal joints. At the ankle the integrity of the distal tibiofibular joint holds the malleoli in approximation to fit properly the trochlea of the talus. The ligamentous attachments between the fibula and talus are of such a nature, as brought out by

*Delivered before the Technic Section of the Forty-Fourth Annual Convention of the American Osteopathic Association, St. Louis, June 27, 1940.

the late R. R. Peckham[1], as to explain tibiofibular lesions predisposing to talocalcaneal lesions. Proximally the head of the fibula provides distal attachment for the lateral ligament of the knee and insertion of the biceps femoris muscle of the hamstring group. A posterior displacement of the fibular head increases the tension in the lateral ligament sufficiently to produce a restriction in adduction movement of the knee.

The arrangement of muscles around the knee is most important in maintaining stability of the joint, not only in the plane of flexion-extension movement, but medially and laterally. The same structures which produce stability are subject to abnormal tensions in the presence of lesion or postural strain.

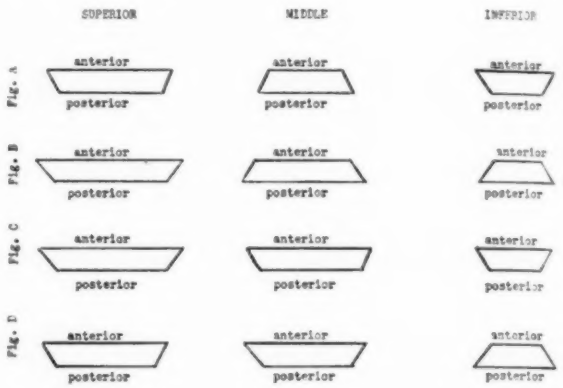
On the lateral side the iliotibial band may be tensed by an innominate lesion or any factor which produces a one-sided postural imbalance. Tension on the biceps femoris which inserts on the head of the fibula restricts movement in the proximal tibiofibular joint with knee symptoms as already explained.

The tendons of gracilis, sartorius, semitendinosus and semimembranosus muscles cross the medial side of the knee from pelvis to tibia and must be thought of in association with short leg, pelvic shift or rotation, or sacroiliac lesion even without knee symptoms. Abnormal tensions are of diagnostic significance in the evaluation of remote effects of lesions or imbalance.

The hip joint has been dismissed as unimportant from the standpoint of lesion since it is a ball and socket joint and, therefore, not subject to subluxation as we ordinarily think of the term. No one denies that the muscles which move the hip are subject to pathological states which alter their tonus, resiliency, length, and function. The resultant impairment in the quality or amount of motion at the joint may become apparent when maximum function is demanded. Failure to meet the requirement may result in localization of harmful stress at another joint, particularly the sacroiliac. It is observed that results in sacroiliac problems frequently are obtained more readily and are more permanent after passive stretching of the hip joint or soft tissue work directly to the gluteal and small deep rotator muscles than if such work is not done.

The sacroiliac joint differs greatly in different specimens as regards size and shape of auricular surfaces and the manner of wedging of the sacrum between the innominates. Anatomy textbooks and our own observations agree that the width of the sacrum is greater near the upper than the lower end. This is similarly true at the auricular surfaces, so that the sacrum is wedged to prevent downward or caudal glide between the innominates. Since textbooks differ as to the manner of wedging in the anteroposterior plane, an investigation was begun using calipers to measure the width of sacrum at various points on the auricular surfaces including the margins. Although the study is not yet complete, the findings at least show that considerable variations do occur.

The findings may be explained best by the accompanying illustrations which represent transverse sections at three levels, near the upper end of the auricular surface, near the middle at the junction of the arms of the L-shaped articulation, and finally near the lower end of the joint. Three specimens were found as illustrated in Figure A, three as in Figure B, two as in Figure C, and one as in Figure D.



Far-reaching conclusions must not be drawn regarding sacroiliac motion or types of lesion since this study is entirely inadequate. It is possible that the variations in type and amount of motion which we find in symptom-free sacroiliac joints may be explained by variations in wedging. This may explain also why any one method of sacroiliac adjustment does not accomplish good results in all cases even when the positional diagnosis is the same.

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1. Peckham, R. R.: Some Anatomical Mechanics of the Foot. Jour. Am. Osteop. Assn., 1933 (Jan.) 32:171-174.

A METHOD OF ANATOMY

The study of human anatomy may be attempted in either of two ways. One consists in collecting facts and memorizing them. This demands a memory which is wax to receive impressions and marble to retain them. Even so endowed a student will not master the infinite complexities of the subject. The other way consists in correlating facts, that is, studying them in their mutual relationships. This leads inevitably to the apprehending of the underlying principles involved, and the "raison d'être" of such relationship. The student will thus learn to reason anatomically and will find the acquisition of new and related facts an easier task. . . .

The markings, lines and ridges, depressions and excrescences, on a bone tell a story as do the scars and irregularities on the earth's surface. . . . They are in the main to be interpreted by references to the soft parts that surround and find attachment to them. . . . The shafts of the bones are considered with the surrounding soft parts; the ends with the joints into which they enter. The bones of the foot are primarily considered as a single mechanism—so are those of the hand and of the skull. . . .

It is not the mere presence of a ligament or its name that is of interest, but the functions it serves. These depend commonly on the direction of the fibers of the ligament; occasionally on their precise attachments. Many fibrous bands bearing individual names are really members of a community. A challenge thrown at one must be taken up by all. They act in unison and therefore they are considered together as a unit.—J. C. Boileau Grant, M.C., M.B., Ch.B., F.R.C.S. (Edin.), from "A Method of Anatomy: Descriptive and Deductive." Ed. 2. The Williams and Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, 1940.

Some Common Anomalies, Variations and Diseases of the Pelvis and Lower Extremities*

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The complete discussion of this subject is obviously not within the scope of this paper; there are large sections of standard textbooks on roentgenology devoted to this topic alone.

Since we are limited in our space, we will attempt to describe briefly some of the more important and a few of the interesting conditions of the pelvis and lower extremities, pointing out their bearing, direct or indirect, upon osteopathic problems, primarily those dealing with postural changes.

It is, I believe, the general consensus of our profession that the main controlling factor of good body mechanics is a normal, mechanically correct, and stable base of support, and that any anomaly, disease, or variation in this foundation will pervert, to a greater or less degree, depending upon its severity, normal spinal relationships above.

To this end Hoskins[1], and later Beckwith[2], developed methods of taking standing pelvic radiograms and of measuring the plates for the purpose, among other things, of determining the presence or absence of an anatomic short lower extremity. These methods, used widely throughout our profession today, have contributed much to our understanding of scoliosis and low-back conditions, and have led to the use of heel and foot lifts in shoes of patients to compensate artificially for the anatomic difference in leg lengths.

In considering some of the etiologic factors of so-called "short leg," let us start with the foot and ankle.

FOOT CONDITIONS

Flat foot may be unilateral or bilateral. If unilateral, the distance between the floor and the superior articular surface of the femur on the same side will be shortened; even if bilateral, an error of locomotion will be introduced. The dropping of the tarsal arch can be diagnosed by inspection.

Calcaneal spur, which used to be considered pathognomonic of gonorrheal arthritis, will cause locomotive errors because of the pain produced in walking. A lateral radiograph of the foot will clinch the diagnosis.

Compression fracture of the calcaneus, usually resulting from falling from a considerable height and landing on one or both feet, will shorten one extremity, which shortening usually persists despite apparently adequate treatment with traction through a Steinmann pin.

Köhler's disease, or aseptic necrosis of the tarsal navicular bone—usually a disease of childhood—may result, if left untreated, in faulty foot mechanics and a shortening of the leg on the same side.

Severe ankle fracture with overriding fragments and malunion obviously will shorten the extremity.

Club foot, a congenital deformity, is self-evident and, if left untreated, will interfere with mechanics of the foot which in turn disturbs pelvic and spinal mechanics.

KNEE CONDITIONS

The knee may be the site of a pathological condition affecting the base of support as is exemplified in the following:

Atrophic arthritis which, if unilateral, may shorten one extremity from one-eighth to a quarter of an inch. The x-ray findings are primarily those of a decrease in cartilage thickness and later sclerosis of the bony articular margins.

Incomplete extension of the knee, from whatever cause, be it tendon shortening, massive exostosis, or ankylosis as from tuberculous, osteomyelitic, or traumatic arthritis may shorten the distance from femur top to floor.

Schlätter-Osgood disease, or separation of the tibial tubercle, usually at its epiphysis, can and does result in painful and incomplete extension of the knee.

FEMUR AND HIP JOINT CONDITIONS

Fracture of the femoral neck with a resultant coxa vara, a diminishment of the normal 125 degree angle between the neck and shaft, or less commonly coxa valga with an increased femoral neck angle, can lengthen or shorten an extremity.

Fracture of the femoral shaft with overriding of the fragments is a very common cause of gross shortening of a lower extremity.

Atrophic arthritis in the hip joint, as in the knee, will produce anatomic shortening and frequently painful locomotion.

Congenital hip dislocation, the diagnosis of which usually is made from the characteristic "duck-waddle" obviously will lower the pelvis on the affected side.

Perthes' disease, resulting in flattening of the femoral head, is not extremely uncommon and may account for difference in leg lengths.

Charcot's joint, or so-called neuro-arthropathy, because of the repeated trauma going on within the joint which is not felt by the patient, leads to a severe arthritis and eventual obliteration of the articular surfaces.

Osteomyelitis, because of the extreme sclerosis accompanying the condition, can actually lengthen the shaft of a bone or even shorten it if an epiphysis becomes involved.

CONDITIONS OF THE PELVIS

The pelvis itself may be the primary cause of

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its own defective mechanics as, for example, in the following conditions:

Severe pelvic injury with grossly perverted bony relationships.

Asymmetrical development, one ilium being smaller than the other.

Secondary neoplastic metastases in the pelvic bones. These are common aftermaths of primary uterine or prostatic cancer; the neoplastic soft tissue displaces the bone and, being unable to bear body weight, collapses.

Albers-Schönberg disease, or chalky bones, is an interesting but very rare disease, there being only about fifty-five cases reported in the literature. It usually is seen best in the pelvic bones; spontaneous fracture following insignificant trauma is the usual history.

Sacroiliac arthritis is usually a secondary result of chronic pelvic obliquities, the patient having a diathesis to the condition which attacks the chronically displaced and consequently irritated sacroiliac joints and is seen on the x-ray as a marginal condensation of bone and later an ankylosis. An exception to this finding is Marie-Strümpell disease, an ankylosing spondylitis the etiology of which is not definitely known. It seems first to ankylose the sacroiliac articulations and then to proceed up the spine, the sacroiliac involvement being a criterion for the early diagnosis of the condition.

Sacralization and lumbarization of the fifth lumbar segment and of the first sacral piece respectively are rather common anomalies, as is spina bifida occulta, in this region. These congenital deformities cannot be treated completely without surgery, but by compensating for a short lower extremity, if it is present, we can equalize the body weight being transferred through the fifth lumbar and sacrum and thereby effect at least partial compensation for the defective mechanics which these anomalies produce.

An injured epiphysis or epiphyses from a severe fall in early life with a resultant unilateral retardation of growth in an extremity is probably the commonest cause of the many minor short lower extremities seen in general practice.

In closing I wish to emphasize the importance of adequate and repeated radiographic examinations in all cases of postural defect both in an effort properly to evaluate the individual problems that each of these cases presents and also to follow the progress of treatment. The average patient today not only expects a complete x-ray examination but frequently also demands it. The average orthopedic specialist will not consider a case without first consulting with the roentgenologist and we as specialists in the field of manipulative therapy also should insist upon complete radiographic examinations prior to treatment both for the patients' and our own protection.

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REFERENCES

1. Hoskins, E. R.: The Development of Posture and Its Importance. Short Leg. Jour. Am. Osteop. Assn., 1934 (Nov.) 34:125-126.

2. Beckwith, C. G., and Bailey, A. B.: Short Leg and Spinal Anomalies. Jour. Am. Osteop. Assn., 1937 (Mar.) 36:319-327.

Sacroiliac and Postural Changes From Anatomic Short Lower Extremity*

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One important cause for the disturbances of normal mechanics of any part of the spine is anatomical difference in leg length. Probably the most common cause for chronic and recurrent sacroiliac lesions is the presence of difference in leg length. Both of these statements are generally acceptable. The importance and the type of treatment in the presence of such difference is not universally agreed upon. For instance, there are those who do not believe that any attempt should be made to interfere with actual leg length by using lifts, and prefer to control symptoms with osteopathic manipulative treatment. Their argument is that usually by the time the presence of the difference is discovered, the body has made many permanent accommodations for the disturbance. They believe, then, that some assistance such as osteopathic manipulative treatment to the distorted regions will result in a return of the affected part to within its range of accommodation. While this principle is acceptable in particular instances (those in the advanced age classification for instance), there are good arguments against it. The fact that accommodation to a constant irritation is not ever perfect or complete, is generally understood. Then, as long as there is a difference in stress applied through the two femurs to the pelvis, there will be a constant attempt to compensate for this difference. The result is chronic irritation in pelvic and lumbar joints with all of its characteristics. In that light, then, it is quite reasonable that the only way to stop the chronic irritation is to attack the cause, and make some gesture toward assisting all natural forces in overcoming the disorder. By this I mean making some attempt at decreasing or removing the differences in leg length.

It is the purpose of this paper to review the methods by which the innominates and the sacrum attempt to compensate for differences in leg length.

The type and direction of compensatory changes in the spine are dependent upon the type of compensation in the pelvis. (The bony pelvis includes the sacrum and the two innominates.)

The diagnosis of short leg examination has rested almost wholly on standing pelvic x-ray films. The usual technique is to x-ray a person as he stands in the mid-line with the feet together. Such x-ray films demonstrate clearly the relative heights of the femoral heads. In the past the observation of the respective femoral heights was considered the essential part of the diagnosis, and on this the treatment was based. Lately it has been apparent that other observed changes also are of importance. These other changes are the relation of the pelvis to the mid-line (lateral displacement), the rotation of the pelvis as a whole,

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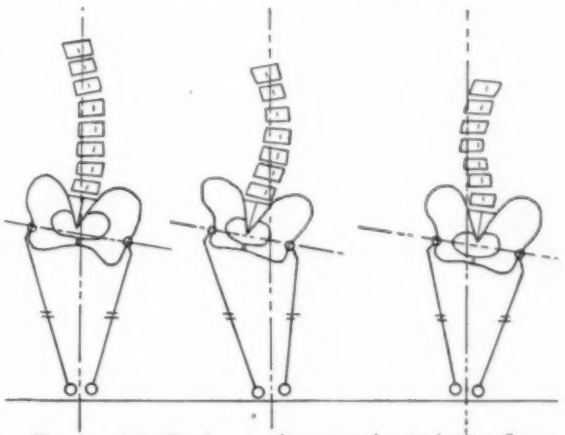
and, of course, the extent of the lateral flexion and rotation of the sacrum if it can be determined. One necessarily must consider all of these factors in advising the use of a lift.

Experience in the past has revealed the following essentials in this problem: The normal pelvis attempts to compensate for a difference in leg length. In its attempts at compensation there are changes in its relation to the mid-line, to the horizontal, and to the sagittal plane. These reactions by a pelvis are divided into two separate types of compensation, depending upon the mechanics of the particular sacroiliac articulations.

In the ordinary or simple case ot short leg, the following changes will occur: The pelvis (including upper sacral surface) will tip and become lower on the side of the short leg (Fig. 1). The pelvis as a whole will be displaced from the mid-line and will move toward the side of the long leg. The pelvis may rotate to the side of the long leg (Fig. 2). The sacrum will rotate to the side of the long leg and lateroflex to the side of the short leg, i.e., sacrum anterior on side of short leg. With this mechanism operating, the lumbar curve will be convex to the side of the short leg with lumbar rotation into the convexity (Figs. 1 and 2). This mechanism is the simplest, the type found ordinarily, and the type most readily affected by treatment with heel lift applied to the short leg.

The other common type of compensatory mechanism has the following characteristics: The pelvis (including sacral top) will be low on the side of the short leg (Fig. 3). The pelvis will be displaced to the side of the short leg. Pelvic rotation is usually absent or to the side of the short leg. The sacrum, in this case, will rotate to the side of the *short* leg and lateroflex to the side of the long leg(relation to pelvis). This mechanism then requires that the lumbar curve be convex to the side of the long leg or, if the convexity is not marked, the lumbar group will rotate to the side of the long leg. This mechanism is dependent upon the presence of a sacroiliac lesion, the lateral displacement and rotation of the pelvis being necessary with that particular type of stress involved in that lesion. The therapy in this type of compensatory mechanism is not as simple as in the previous type, and the use of a lift is divided into two parts. As in the first mechanism, the lift is placed beneath the leg on the side of the anterior sacrum; this is at first the long leg. The effect of this is to change the sacroiliac lesion to the opposite side and thus change the pelvic displacement and rotation. The lift is used on the long leg until the sacrum becomes posterior on that side. When this occurs, the compensatory mechanism has been changed to the simple or primary type of pelvic accommodation and the lift is then placed beneath the short leg. This procedure will facilitate quicker benefits from the attempt to correct a short leg postural difficulty and thereby will decrease the necessity for a number of osteopathic manipulative treatments which may not in themselves be effective in correcting the disorder.

The two compensatory mechanisms described are the common types seen when no complicating factors are present. Occasionally some particular muscular stress will confuse the compensatory pattern. The most outstanding example is the deformity which occurs as a result of psoas contraction. In acute psoas spasm there is little difficulty in recognizing the cause.



Figs. 1 and 2.—Simple type of compensation mechanism. Sacrum anterior on side of short leg. Lumbar convexity on side of short leg. Lumbar rotation is toward side of short leg. Diagrams illustrate average type found upon x-ray examination.
Fig. 3.—Pelvic shift to side of short leg, sacrum anterior and lumbar curve on side of long leg. Mechanism secondary to sacroiliac lesion.

However, occasionally one or the other psoas muscle will shorten from hypertrophy from either a postural stress or an occupational overuse, and cause enough pelvic displacement and lumbar rotation to change the standing posture. When psoas stress is present, it is the most important disorder, primarily, and should be treated as such. Other complicating factors are bony maldevelopments, bad posture habits, or postural errors of an occupational nature.

Although the compensatory mechanisms have been described as being of one of two types, the characteristics of the mechanism may be confused. Or, the mechanism may not be exclusively one or the other in type. In these cases, we can follow the principle used generally and place the lift beneath the leg on the side of the anterior sacrum. Some generalities are probably interesting at this point. In using a lift, likely the shortness seen in the x-ray picture need never be fully compensated for. In interpreting a standing pelvic x-ray plate the following points are generally correct: If the pelvis has shifted to the side of the long leg, the sacrum is probably anterior on the side of the short leg and the lift should be used on that side. If the pelvis has shifted to the side of the short leg, the condition probably will require the lift being used on the long leg temporarily, on which side there will probably be the anterior sacrum and to which side the lumbar vertebrae will probably be rotated. In every standing pelvic x-ray picture we must rule out psoas shortening or hypertrophy by noting the extent and density of the psoas shadow and the relative densities of the two sides.

CONCLUSION

It has been the purpose of this discussion to call attention to the need for studying standing pelvic x-ray pictures not only for the comparison of femoral heights, but also for determining the mechanics of the pelvis. Care of cases of short lower extremity by the use of a lift applied invariably to the heel of the shoe of the short leg is not conducive to the best results. The sacrum and sacroiliac articulations should have attention also; they may be the keys to the compensatory mechanism affecting both the pelvis and the lumbar spine. Treatment of short leg problems definitely should include consideration of sacroiliac lesions.

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Industrial Back Injuries

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The true basis for cooperation between insurance companies writing workmen's compensation insurance and the physician in industry lies in their joint determination to bring about the recovery of the patient in the shortest possible time with the best possible results.*

It would be superfluous to explain how greatly the attainment of the object sought would be to the advantage not only of insurance companies and physicians in industry, but also of employers and workers.

This paper has been prepared for the purpose of advancing cooperation among all these groups. It is intended to show that the diagnosis and care of cases of sprains and strains of the spine by osteopathic physicians not only returns the injured employee to his work in the shortest possible time, but also produces the best results in the way of restored function and health.

One of the greatest obstacles to such cooperation between insurance companies and physicians as has been mentioned is the great confusion of opinion among medical experts, adjusters and other representatives of insurance companies, and members of industrial boards and commissions, in connection with the diagnosis and care of industrial injuries of the lower part of the back. In an attempt to analyze and determine the reasons for this confusion of opinion, it is necessary to study the problem from several angles.

Fundamentally, the evaluation of a back injury disability depends upon an honest, painstaking examination by a well-trained physician who has a thorough knowledge of the anatomy, physiology, and pathology of spinal structures. He should be able to detect by palpation tissue changes that have taken place in spinal ligaments and muscles. He should be able to detect changes in spinal or sacroiliac joint motion.

The lack of ability to make such an evaluation is evident in the confusion of nonosteopathic medical opinion in connection with back injuries, as shown by case reports in their literature, records of expert testimony before industrial compensation commissions, and reports of insurance adjusters. This confusion is reflected in the high indemnity and medical costs of this class of cases. Dr. Leroy Kuhn,† Chief Surgeon of the Lumberman's Mutual Casualty Company, gives the following figures from 1,000 cases of nonfatal back injury:

Sprains and strains of the sacrum and coccyx: average indemnity paid $294.00; average medical cost $78.00.

Sprains and strains of muscles (other than vertebrae, sacrum and coccyx): average indemnity paid $196.00; average medical cost $49.00.

Under cause of accidents, 515 of the 1,000 cases were from lifting and handling of objects. These cases average $231.00 indemnity paid and $58.00 medical costs. (No doubt, these were cases of lumbosacral and sacroiliac sprains).

It is claimed by the osteopathic profession that these costs are much too high. But the blame cannot be placed at the door either of the injured workman who too often is accused of malingering, or of the insurance adjuster, or of the industrial commissioners. Perhaps justly it cannot even be laid against the ordinary industrial physician, because his training has not been such as to equip him adequately to diagnose or to treat these cases.

We should assume that both the workman and the insurance people are honest. The former knows that he might better be at work than collecting insurance. The latter do not want to accuse an employee wrongly of malingering, nor to deprive him of his just compensation.

If the case goes to the industrial commissioners, it is exceedingly difficult for them to determine the percentage of temporary or total disability suffered by a person who has been subjected to an alleged back sprain.

Insurance men and industrial commissioners alike must rely to a great extent upon the reports of the physician handling the case, and his consultants. If an x-ray of an injured employee's spine is negative as to bone pathology from injury, or gross displacement, and there are no objective signs of injury, or infection, the examining M.D. can find no cause for the patient's alleged disability. Therefore, he honestly reports that there is no pathological condition present, with the result that compensation is terminated and the injured worker is classified as a malingerer. Very often an injustice has been done to the employee suffering from a back sprain, because the real trouble has not been found. At the same time, the general suspicion which exists where back injuries are concerned, that malingering is common among workmen, is strengthened. Moreover, the failure to diagnose the real cause of the disability is directly responsible for the high average costs.

The training of osteopathic physicians is such as to enable them to make the kind of examinations the necessity for which has been sketched herein, and to apply the treatment calculated to restore the injured employee to his job.

*The Basis for Cooperation between Insurance Companies and the Physician in Industry: An address by Mr. Ambrose B. Kelly, Chicago, at the first annual meeting of the Congress on Industrial Health, Chicago, January 9, 10, 1939, published in *The Jour. Am. Med. Assn.*, 1939, (Feb. 11) 112:546-547.

†United States Department of Labor, United States Bureau of Labor Statistics Bulletin No. 602, page 117, under heading: "Final Disposition of Back-Injury Cases, with a Summary of 1,000 Compensation Accidents," by Leroy Philip Kuhn, M.D., F.A.C.S., Chief Surgeon, Lumberman's Mutual Casualty Co., President Institute of Traumatic Surgery, surgical staffs Augustana and Columbus Hospitals, Chicago. Title of Bulletin is "Discussions of Industrial Accidents and Diseases" at the 1933 meeting of the International Association of Industrial Accident Boards and Commissions, Chicago.

We have mentioned the confusion of opinion resulting from the lack of fundamental knowledge on the part of the ordinary industrial physician. There are several reasons for the differences of opinion among M.D.'s when called upon to examine a patient who has suffered an alleged back injury.

First: There is usually no objective evidence of injury; i.e., no swelling or mark of any kind. Signs are hidden under the surface. There may be deformity due to spasm of psoas and lumbar muscles. The examining physician must make his diagnosis largely from what the injured person tells him, and from what he can find with the x-ray and functional tests.

Second. The x-ray, depending upon the knowledge and skill of the technician and the interpreter, may show the presence of postural defects, anomalies, arthritis, fracture or gross dislocation, herniated or ruptured disc or malignancies, but usually it will not show slight deviations from normal position.

Third: There are several tests for sacroiliac subluxations which have been described by orthopedists, such as Goldthwait's and Gaenslen's signs. These depend upon pain being elicited and referred to the injured joint on certain movements and positions of the leg. They do not determine the degree of loss of motion in that joint.

Fourth: No tests are generally known by orthopedists to determine the presence of lumbosacral sprains, except gross limitation of spinal motion by muscular spasm, though at least one such writer mentions tender areas.

Fifth: There are no tests or signs in allopathic literature for determining strains or subluxations of other spinal joints.

Sixth: Injury of sacroiliac and lumbosacral joints tends to recur when the worker attempts to do work which requires stooping or lifting, especially when untreated or improperly treated, even when considerable recovery apparently has taken place.

In contrast with the differences of opinion among M.D.'s examining a case, which differences arise largely from the causes just outlined, there will be found a reasonable uniformity in the findings of osteopathic physicians, because these have evolved methods of diagnosing strained or subluxated joints based upon increased knowledge of joint physiology. They have developed an acuteness of the sense of touch necessary to recognize minute tissue changes in and about the joint, such as edema, tenderness, thickening of ligaments, and contraction of muscles. They have devised functional tests for determining slight degrees of joint disturbance, including decrease or increase of normal motion.

They do not undervalue the importance in making a differential diagnosis, of the taking of a careful history, a history that is complete not only since the time of the accident, but also prior thereto. Osteopathic physicians recognize the importance of many seemingly trivial things in such a history, because of their relation to the production or maintenance of the osteopathic lesion.

In short, osteopathic physicians see in the osteopathic joint lesion a condition which is not recognized or fully understood by any other physician. They, therefore, would much more generally agree upon the diagnosis in cases of low-back injury than would allopathic physicians because the osteopathic joint lesion is such an important part (when it is not the whole) of the difficulty.

The confusion and inadequacy in diagnosis on the part of the one school of physicians is mirrored in its treatment of cases of industrial low-back injuries, which consists of rest in bed, application of heat, diathermy or short wave, adhesive strapping or supports, and extension. Nothing is done to reestablish the normal motion of the joints. Thus the patient is not permanently relieved. This is in contrast with the understanding of the condition, and the favorable results secured in its treatment, by those trained in osteopathy.

While in this connection our interest is directed at trauma as the cause of disability, it would be well at this time to consider other factors which would produce symptoms of back sprain. One of the most difficult questions a physician must decide is whether the disability of a workman with an alleged back injury is due to trauma; or to infection or other toxemia; or whether there is a combination of the two. A slight strain, such as sometimes results from stooping, in a person with toxic lumbar muscles, may produce a disabling type of lumbago, which in reality is due to toxemia, rather than to the physical strain. The osteopathic physician is in a better position than any other to recognize the two etiologic factors and properly to evaluate them.

There may be no other way of determining which is the primary cause of disablement, except by the method of trial and error. If upon adjusting the spinal subluxation by manipulation the workman shows immediate and marked improvement, which improvement continues on the following days, one can be certain that trauma was the main cause. If, however, after osteopathic manipulation, the apparent improvement disappears, and next day the patient has as much pain and spasm as before the correction, we must naturally suspect that toxemia, and not trauma, is the important factor in causing disability.

With the information obtained from a thorough physical and neurological examination, plus the reaction to an osteopathic adjustment of spinal or sacroiliac lesions when present, the osteopathic physician is in a position to say definitely whether a backache is due primarily to trauma, or to toxemia.

If a patient, having suffered trauma, has a pain where he had none before, or a nondisabling distress has become a disabling pain, then it is a reasonable hypothesis that the backache in such a case was due to the trauma. It will respond to osteopathic manipulation with immediate and sustained improvement. A patient with a backache due to visceral disease may have his condition aggravated by trauma. A slight injury, with resulting backache that is disabling, should make one suspect preexisting visceral, osseous, or articular disease. Any improvement following osteopathic manipulation in a case of this type is only tem-

porary, as a rule, and the pain reverts to its original severity by the following day.

Diseases and accidents of childhood may affect the growth of one of the leg bones, so that a prominent hip and curvature of the spine may result. A difference in leg length alters the level of the sacrum, placing a continuous strain upon the sacroiliac and lumbosacral joints and ligaments, predisposing them to injury. A workman so constituted is predisposed to a disabling sprain, and the training of the osteopathic physician is such as to lead him to look for, to evaluate, and to correct such a condition.

A minimum of attention is devoted, in this paper, to conditions such as posture, body build, anomalies, arthritis, and others which are recognized about equally by osteopathic and nonosteopathic physicians, since their consideration would not be pertinent to the theme. And we proceed, without further discussion, to the presentation of a collection of statistics resulting from a nation-wide survey of the costs of industrial compensation cases of back sprains treated by osteopathic physicians. The survey was conducted by the Bureau of Industrial and Institutional Service of the American Osteopathic Association, beginning in September, 1935, and terminating in July, 1939. Its object was to collect reports on a large number of compensation cases to provide statistics for presentation to insurance companies, compensation commissions, and organizations of workers, bringing to their attention the ability of the osteopathic physician to return the injured workman to his job in the shortest period, with restored health and at a low cost.

Report blanks were prepared and distributed nationally to osteopathic physicians, asking for the following information:

Name and address of reporting doctor.

Name or designation of patient.

Date of injury.

Diagnosis of injury.

Time lost from work.

Number of visits, or treatments administered.

Fee per visit.

Total fee received.

Name of employer.

Name of insurance carrier.

Case reports were received from practically every state in the Union, and a few from provinces in Canada.

A total of approximately 10,000 compensation cases were reported, of which 6,018 were of back sprains: sacroiliac, lumbosacral and other spinal sprains. The balance of approximately 4,000 cases included fractures of all types, sprains of joints of the extremities, burns, foreign bodies in the eye, wounds and lacerations.

Because of the recognized ability of the osteopathic physician to diagnose and treat back sprains successfully, special emphasis was placed upon this type of injury in this survey.

Cases reported cover the period from 1931 to 1939. The results were affected somewhat by the depression years, when several states having their own insurance funds, deducted from 5 to 20 per cent from each statement rendered.

The vast majority of cases were reported by osteopathic physicians located in cities and communities of less than 200,000. A very small percentage, less than one per cent, were collected from the metropolitan cities, where the fee schedules are higher. The results presented, therefore, do not represent fairly costs in larger cities.

Of the case reports received, only a few, not more than twenty, included the cost of x-ray examination. In many more cases, no doubt, x-ray examinations were made but costs not reported. The costs presented do not include radiographic expense.

Fig. 1 illustrates an analysis of the 6,018 cases.

For the purpose of this survey, states have been divided into three groups or classes, according to fees paid and to some extent to the type of medical aid permitted by their compensation laws. In Group 1 are placed all states which permit the employer to insure in a regular liability insurance company, or be self-insurers, or operate under a

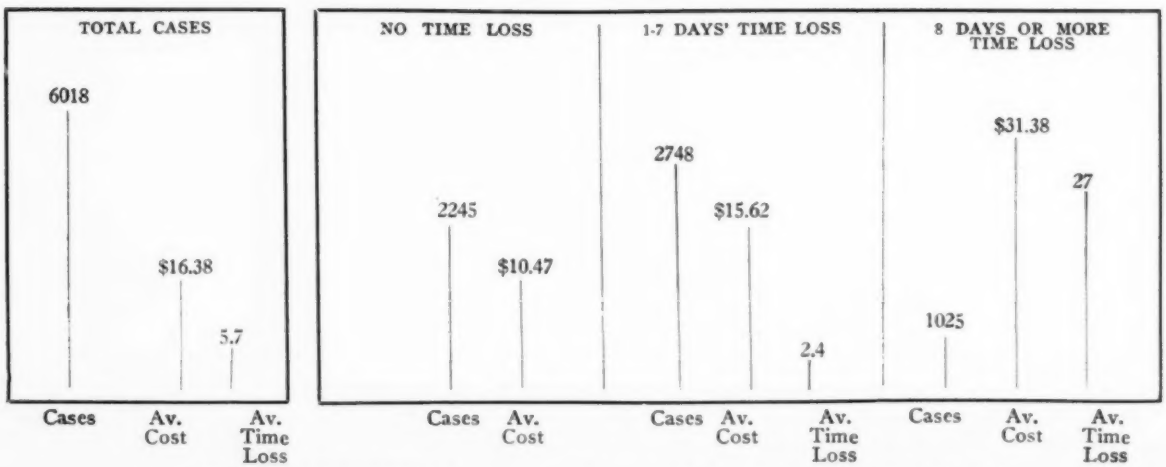


Fig. 1. An analysis of 6,018 industrial compensation cases of back sprains treated by osteopathic physicians and showing average costs and average time lost from work.

	NUMBER OF CASES	% OF TOTAL NUMBER OF CASES	TOTAL COST	AVERAGE COST OF CASE	TOTAL DAYS OF TIME LOSS	AVERAGE TIME LOSS, DAYS
No time loss	2,245	37.3%	$23,491.66	$10.47	0	0
1-7 days time loss	2,748	45.7%	$42,930.00	$15.62	6,538	2.4
8 days or more time loss	1,025	17.0%	$32,163.07	$31.38	27,686	27.0
Total	6,018	100.00%	$98,584.73	$16.38	34,224	5.7

Table 1. Table showing average cost and time loss data.

	CASES	AV. NO. OF DAYS LOST FROM WORK	AVERAGE COST
7 days or less lost from work	1,601	1	$19.40
8 days or more lost from work	273	25.6	$37.60
Total	1,874	4.59	$26.86

Table 2. Analysis of 1,874 cases reported in summary form.

	NUMBER OF CASES	% OF TOTAL NUMBER IN GROUP	NO. OF DAYS LOST FROM WORK	% OF TOTAL DAYS IN GROUP	TOTAL NO. OF DAYS LOST FROM WORK
Group 1	122	7%	7,706	61.7%	12,656
Group 2	59	5.2%	3,585	56%	6,371
Group 3	43	3.5%	2,527	40%	6,329

Table 3. Cases with 22 or more days of disability.

state fund, in which the customary fee charged by the physician in his private practice is allowed. In Group 2, are placed states with insurance funds and some states with fee schedules. As a rule, the fees allowed in this group are slightly lower than in private practice. In Group 3 are placed those states which operate mainly on a contract basis and whose fees are low.

Group 1 includes all states not included in Groups 2 and 3.

Group 2 includes Ohio and several western states: Washington, California, Idaho, Montana and North Dakota.

Group 3: Oregon.

There were two or three states, operating wholly or partially under the contract system, whose cases should be included in Groups 2 or 3, but because the number of cases reported from these states were so small, they were left in Group 1.

Oregon is one of the states which uses the contract system of medical care. Contract practice in this state is probably a natural outgrowth of its industrial development. One of its chief industries is lumbering and allied businesses. Many of its plants and mills, at least in their beginnings, were located in out-of-the-way communities, where it was difficult to obtain adequate medical and hospital care. As a consequence, contracts were made with groups of physicians, known as hospital associations and county physicians' associations, to take care of the injured, and sick as well.§ The fees paid by these associations are low, and several limit each case sent to an osteopathic physician to three visits. The usual fee allowed is five dollars for three visits.

Because the osteopathic physicians of Oregon have reported 1,242 cases, which is over 20 per cent of the total number of this survey, and because the fee schedule and average cost a case is low, an analysis has been made to determine the effect of these cases on the general results of the survey.

Two states sent in 1,874 cases in summary form. Because it is impossible to figure medians of these cases, they were discarded in the graphs (Figs. 2 and 3), leaving a sample of 4,144 cases.

Table 2 shows the average cost and disability periods of these 1,874 cases.

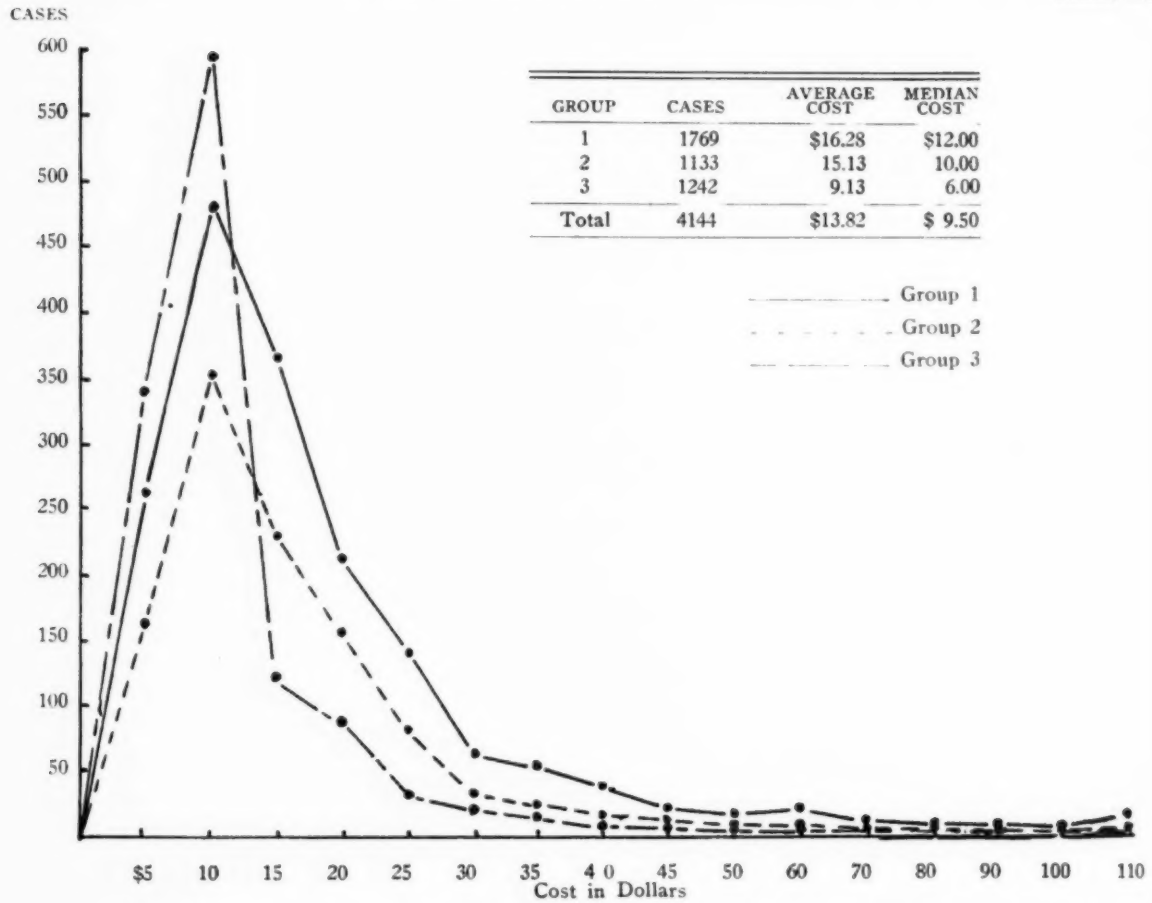
Fig. 2 shows the graphs of the cases reported from the three groups of states. These graphs show the distribution of cases according to cost, and the average and median costs of each group of cases. A median represents the level above and below which equal numbers of cases occur.

In studying Fig. 2, it might be observed that the graphs of the Groups 1 and 2 cases have more cases than Group 3 in the $10.00 to $15.00; $15.00 to $20.00, and $20.00 to $25.00, etc.

Fig. 3 shows the distribution of cases according to the number of days lost from work.

A study of Fig. 3 indicates that the graphs are very similar. This would tend to prove that the

§Dodd, W. F.: The Administration of Workmen's Compensation. 1936 ed. The Commonwealth Fund, New York.



GROUP	CASES	AVERAGE COST	MEDIAN COST
1	1769	$16.28	$12.00
2	1133	15.13	10.00
3	1242	9.13	6.00
Total	4144	$13.82	$ 9.50

Fig. 2. Distribution of compensation cases according to cost. Group 1: Cases from states not included in Groups 2 and 3. Group 2: Cases from Ohio, California, Idaho, Montana, North Dakota and Washington. Group 3: Cases from Oregon.

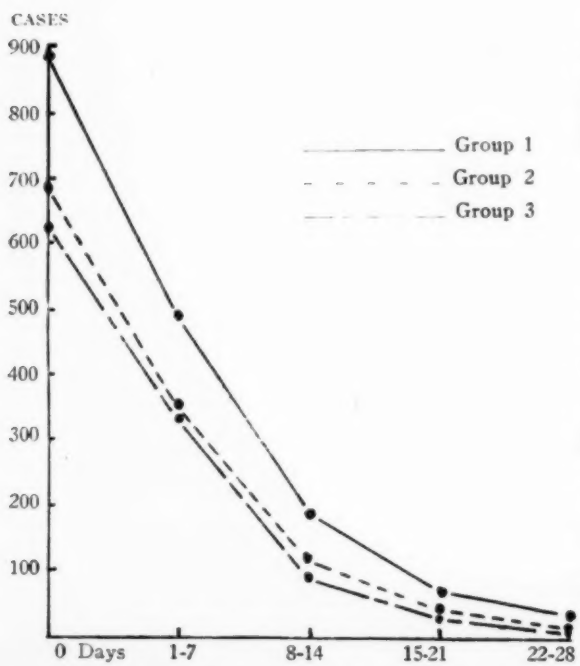


Fig. 3. Distribution of cases according to time lost from work.

frequency of cases up to 21 days of disability have an identical disability curve in the three groups of states, regardless of fee schedules or different methods of providing medical aid. The great differences in the number of days lost from work occur in those cases having twenty-two and more days of disability. Table 3 shows these differences.

CONCLUSIONS

1. The medical cost of osteopathic care of industrial back sprains ranges from an average of $9.13 to $26.86, depending upon location and method of providing medical aid. These figures do not apply to metropolitan cities. They do not include radiologic expense. The general average of this survey is $16.38 a case.

2. Approximately 80 per cent of the cases have seven days, or less, loss of time from work. In states having a waiting period of seven days, the only expense to the insurance carrier is the medical cost.**

**"Thirty-two states have a waiting period of seven days before compensation begins"—McBride, Earl D.: Evaluation of Disability. J. B. Lippincott Co., Philadelphia, 1936.

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SEE PAGE 119

Thoughts on the Autonomic Nervous System

Part III

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CHAPTER VIII

Hilton's law is "The nerve supplying a joint supplies also the muscles which move the joint and the skin covering the articular insertion of those muscles" (Stedman). Since obviously not all of the muscles moving a joint are supplied by the same nerve, it follows that few, if any, joints are supplied by but one nerve. The postganglionic fibers which accompany the central fibers join the latter from the ganglia of the same segment. The preganglionic fibers arise in many cases from lateral horn cells in different segments.

The arterial supply to the joints and the muscles controlling it do not depend for its innervation on branches from the same spinal segments that furnish sensory and motor fibers. The limb plexus of the upper extremity arises from the fifth cervical to the first thoracic and the inferior cervical ganglion receives preganglionic fibers from these thoracic segments; the limb plexus of the lower extremity is formed from the first lumbar to the fourth sacral. The white rami communicantes are inadequate or lacking in these regions as are the posterior primary divisions of the anterior root nerve.

The various arthropathies are dependent for their treatment on a correct interpretation of innervation. There have been many brilliant successes following sympathectomy. Some of its unexplained failures may be traced to an incomplete understanding. The same may be said for the successes and failures following the eradication of foci of infection. Whereas such foci have been considered (and rightly) to be responsible for damage through their toxins, less consideration has been given them as a source of inimical impulses which, being conveyed to the sympathetics, result in vasomotor spasm.

An approach to the autonomic nervous system in the light of these and other examples may call for a complete reclassification of disease. Adjustment to the erect posture is not yet fully accomplished, and may never be. R. R. Peckham[30] has stated very concisely, "Lesser forces applied to a joint in a manner for which the joint is not designed, may injure soft tissue first. Greater stress applied in the direction for which the joint is designed will produce bone injury before ligamentous injury." The spinal joints and pelvis are not designed for the erect posture. Any force, however mild, may result in injury to the soft tissue of the spine. It is rational that this be considered as of first importance in etiology for the reasons stated. Soft tissue injury in this region, even if microscopic, interferes with autonomic function and may be manifest as pilomotor, vasomotor, cochlear, ciliary or visceral motor disorder. The first may be relatively insignificant, or may seem so because of our ignorance. The implications of the second are infinite: any bacterial invasion is dependent upon the medium for its success—the soil can be prepared only by inadequacy of the circulation. The third and fourth are probably only of local importance and the last is only subservient to the second in its importance. By association it follows that under certain conditions muscles ordinarily acting from a fixed base may reverse their roles and move the point of origin rather than the point of insertion. This is productive of an articular lesion and there is soft tissue injury, for the direction is one for which the joint is not designed.

It is therefore necessary to consider muscles moving joints in reverse of their physiologic role, e.g., muscles designed to move the articulations of the extremities arise over joints of the vertebral column which in this instance acts as a fixed base. Not infrequently, from forces invoked in a direction contrary to the normal aptitude of the muscle, the joints at the origin are moved.

The nerves supplying these muscles (as mentioned previously) do not supply the joints they are not designed to move, and since they do not act in consonance, injury results. Muscles acting from the extremities to move more proximal joints move them in a direction for which they are not designed and for which a neuromuscular coordination is not provided. This might be considered a corollary to Peckham's dicta. It might be stated further that these joints do not recover their normal mobility readily, and infrequently do they do so without intervention of extraneous forces.

The vertebral articulations are innervated commonly by the posterior primary divisions of the corresponding segmental nerves. Muscles having attachment to these vertebrae, and moving joints of the extremities, frequently receive innervation from other than the segmental nerve so that a lesion at the attachment (origin) of the muscle may not affect the innervation of the muscle or the joint which it moves directly, but may affect its trophicity through the sympathetic portion of the segmental nerve.

Muscles derive their sensory and their motor innervation from the same levels. The sudomotor, pilomotor and cutaneous sensory nerves in the skin lying over those muscles and, likely, the vasomotors, derive from a common segmental level, but this does not correspond with the sensory motor innervation to the muscle.

A very good example of the anatomy involved here is seen in H. H. Fryette's[31] observation that a periarticular perversion in the region of the second lumbar vertebra is frequently associated etiologically with a prepatellar bursitis. To reverse the order of this observation and say that the prepatellar bursitis is responsible for a periarticular perversion of the second lumbar is just as reasonable. The trauma, given as the cause, produces a lesion which by its disabling character may, through direct mechanical action, produce such a perversion and this in turn, by way of the sympathetic fibers accompanying the anterior root exiting at that point, produce circulatory and trophic

changes in the knee. It is well to point out here also that the spinal joints are not necessarily supplied by nerves leaving the canal at the same level. With the exception of those in the cervical region, the individual nerves are numbered according to the vertebra below which they emerge from the vertebral canal. Their origin, however, from the cord may be one or more vertebrae above.

HEAD'S LAW

Head's law is "When a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the pain produced is felt in the part of higher sensibility rather than in the part of lower sensibility to which the stimulus was actually applied." (Pottenger). Tasker[5] goes on to show how this may be applied in two ways: First, a stimulus applied at a point in the course of a nerve will be felt at its distribution, or so interpreted; second, a stimulus to a nerve of low sensibility (visceral afferent) will be transferred to a somatic nerve and interpreted as deriving from the area of distribution of the latter.

Head's law is premised on sensory interpretation. There are many afferent impulses which do not reach the sensorium. These are concluded by action potentials. Cognizance is taken of this in the fact that the visceral sensory nerves are sometimes designated as sympathetic afferent. This dual nomenclature is misleading and confusing. Head describes a sorting out of sensory impulses and their regrouping at higher levels. For a visceral sensory impulse to be interpreted as pain, it must pass an extra synapse, so must be above the maximum of the effective action potential. It is this regrouping at higher levels that enables sensation to be localized at a given point although the muscles and the skin covering them are innervated by different nerves.

No part of the human anatomy is a separate unit. Any disturbance in any portion is reflected first in the tissue of the corresponding spinal segment. It may be undemonstrable but the fact holds true, from the slightest wound or alimentary upset to the grossest tissue change. If this were not so, severe damage would often follow minor lesion and the protective and reparative processes would not be instigated. That there is not greater reflex disturbance in gross lesions, whether visceral or skeletal, is due to the biphasic activity and fatiguability of the nerves which is, in this case, a defense. Hyperalgesia occurs in the skeletal tissues in the nearest segmental relation to the irritated visceral nerve. This is probably an example of protopathic quality.

Less easily demonstrated would be a hypoesthesia in skeletal tissue in segmental relation with an inhibited nerve. It is as necessary for normal muscle tone that the impulses reaching them be sufficient, as that they be not increased (*vide*: Part I, paragraphs 4 and 5, first column, page 539, August JOURNAL).

That in the case of skeletal lesions the pain is interpreted at its source, and in visceral lesions at the nearest segment, does not detract from the general scheme.

The finer discriminations of the voluntary system are for voluntary action while the finer discriminations of the involuntary system appear to be for involuntary action. On the other hand, grosser irritation may be transferred to the opposite system for response. An appreciation of character, texture, size, etc., of an object enables it to be grasped or repulsed at will and the only sympathetic response is through the need of more adequate blood supply because of the muscular activity; whereas with heat and cold, which are protopathic sensations, the impulse is transferred to the autonomic system directly by reason of a necessity to maintain the temperature of the part. In the viscera the presence of food demands an increase of blood supply and motility of the alimentary canal. This takes place without the impulses being conveyed to the sensorium.

Conversly, lesions affecting the transmitting mechanism, i.e., the medulla or its housing and adnexa, whether they be the slightest trauma or a more gross tissue destruction, are reflected in distant tissue. Here again, the former may have more clinical significance than the latter since the latter, unless defense is rapidly instituted, will prove fatal.

Thus hypertonicity of the spinal musculature, edema of the structures in the intervertebral foramina or of the meninges, and altered pH occur as the result of trauma, or reflexly of nerve irritation, and act to disrupt the orderly operation of the transmitting phase. Trauma may arise from strains or blows; in either case the mobility of the articulation is lessened and the circulation decreased. Invasion by pathogenic organisms, solution of continuity, and gross trauma demand emergency measures apart from autonomic consideration. Even in these the attempt at conservation is observed, showing that although badly damaged the system attempts to preserve itself.

From this it is not difficult to visualize autonomic motor disturbances resulting in hyperemia, ischemia, atony or spasm of involuntary muscles, in tissue supplied by nerves from the same or corresponding segments. It is not pertinent to inquire into whether the afferent or the efferent impulses are disturbed. A new pathological condition arises if either are disturbed and itself becomes a source of inimical impulses. If it were not for biphasic or even multiphasic propensities of the nerves, a chain of reactions would arise consuming in its proportions. There is another limiting agent and that is the deterring effects of the products of cell metabolism. These have the power, at one and the same time, to stimulate the nerve ending and to inhibit the conduction of the impulse. The process of life is carried on by means of checks and balances. It is through this that disease is self-limiting. It is through an understanding of these that the physician's efforts are most effective, and it is because these are maintained largely through the nervous system, and particularly the autonomic system, that the latter deserves attention. It, rather than the endocrines, might be regarded as the governor, particularly if the posterior hypophysis and adrenal medulla are included.

The peculiar property of turning to good account mild external stimuli is not readily explainable. Diverse pathological conditions respond favorably to rhythmical impressions made in paravertebral srtuctures. These may be applied under various techniques and still obtain a desirable response.

A converse of Head's law might be stated thus: a welcome stimulus, applied near the spinal ganglion of the segmental nerve to which the visceral painful stimulus has been transferred, will be appreciated and used by it to mitigate or ameliorate the disease. This has been variously described as inhibition, dis-

(Continued on page 120)